

California Environmental Protection Agency

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**Air Resources Board**

**Vapor Recovery Test Procedure**

**TP-201.1B**

**Static Torque of Rotatable Phase I Adaptors**

**Adopted: July 3, 2002**

Note: All text is proposed for adoption. As authorized by title 2, California Code of Regulations, section 8, the use of underlines to indicate addition or adoption is omitted.

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Definitions common to all certification and test procedures are in:

**D-200 Definitions for Vapor Recovery Procedures**

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

**1. PURPOSE AND APPLICABILITY**

- 1.1** The purpose of this procedure is to quantify the amount of static torque required to start the rotation of a rotatable Phase I adaptor. This procedure determines compliance with the performance specification required by CARB.

**2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE**

- 2.1** A compatible dust cap is installed on a rotatable Phase I adaptor. A Torque Test Tool is then installed on the dust cap and three static torque measurements are taken. If the resulting, average static torque is less than, or equal to, the maximum allowable static torque value specified in Certification Procedure CP-201, the adaptor is verified to be in compliance.

**3. BIASES AND INTERFERENCES**

- 3.1** Missing or defective gaskets in the dust cap may bias the results towards compliance as a dust cap may slip on the rotatable adaptor prior to the adaptor rotating. This bias is eliminated by ensuring that the dust cap seal is securely in place and does not show signs of excessive wear or damage.
- 3.2** Gasoline or other lubricants on the sealing surface of the rotatable adaptor or the dust cap seal can cause the dust cap to slip and may bias the results towards compliance. This bias is eliminated by ensuring that the sealing surface of the rotatable adaptor and dust cap is clean, dry and free of lubricants.

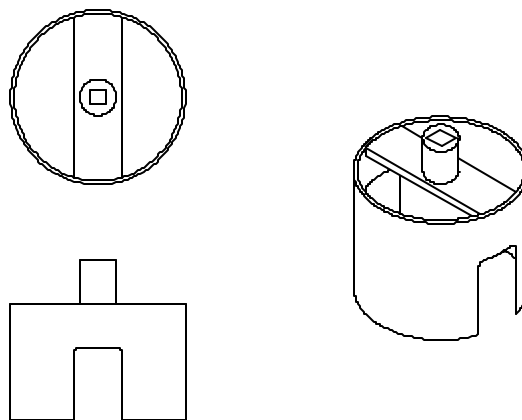
**4. SENSITIVITY, RANGE, AND PRECISION**

- 4.1 The measurable static torque is dependent upon the range of the Torque Wrench used for the test. The recommended Torque Wrench range specified in Section 5.1 provides sufficient precision at the maximum allowable static torque.

## 5. EQUIPMENT

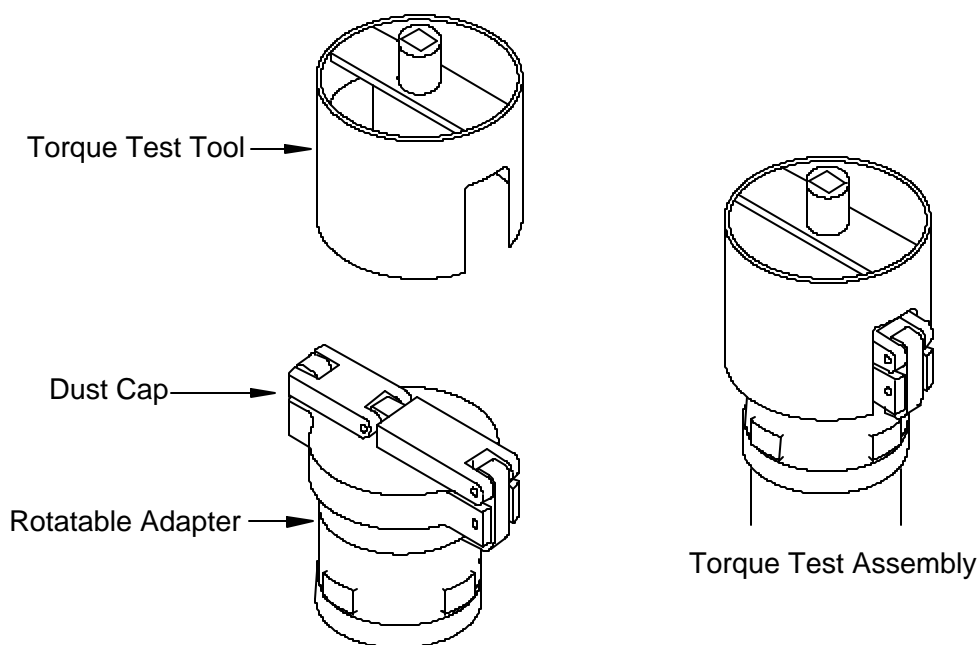
- 5.1 Torque Wrench. Use a compatible Torque Wrench to measure the static torque of the rotatable vapor recovery adaptor.
- 5.1.1 The minimum full-scale range of the Torque Wrench shall be 144 pound-inches (12 pound-feet) with minimum accuracy of 3.00 percent.
- 5.1.2 The minimum readability of the Torque Wrench shall be 5 .00 pound-inch increments to ensure accurate readings.
- 5.2 Static Torque Test Assembly. Use a compatible dust cap and rotatable adaptor Torque Test Tool, Phil-Tite<sup>®</sup> Part Number 6004 or equivalent. A depiction of the Phil-Tite<sup>®</sup> Torque Test Tool is shown in Figure 1. An example of a complete Static Torque Test Assembly is shown in Figure 2.
- 5.3 Socket wrench and socket extension. Use a  $\frac{3}{8}$  inch or  $\frac{1}{2}$  inch socket wrench, adaptors and socket extension (if needed) to verify 360-degree rotation or to conduct static torque testing. The socket extension shall not exceed 12 inches in length.

**Figure 1**  
**Phil-Tite<sup>®</sup> Torque Test Tool**



- 5.4** Traffic Cones. Use traffic cones to encircle the Phase I area while the test is being conducted.

**Figure 2**  
**Static Torque Test Assembly**



## **6. PRE-TEST PROCEDURES**

- 6.1** Place the traffic cones around the perimeter of the Phase I spill containment buckets, allowing sufficient space to safely conduct the test.
- 6.2** Remove the lids of the Phase I spill containment buckets. Visually determine that the adaptors are of the rotatable design.
- 6.3** Inspect the dust caps to ensure that the caps and that the gaskets are intact and do not show signs of excessive wear or damage.
- 6.4** Inspect the rotatable adaptors. If the adaptors are wet or covered with a lubricant, wipe the adaptors clean to ensure maximum friction between the dust cap and the adaptor seal surface.

## **7. TEST PROCEDURE**

- 7.1 Install the dust cap on the Phase I rotatable adaptor.
- 7.2 Install the Torque Test Tool on the dust cap as shown in Figure 2.
- 7.3 Verification of rotation, conducted prior to the Static Torque Test. Place a socket wrench with socket extension (if required ) into the Torque Test Tool, or equivalent. Rotate the adaptor a minimum of 360 degrees. Note: do not continue if the adaptor does not rotate 360 degrees.
- 7.4 Install the Torque Wrench into the Torque Test Tool. If the spill containment bucket is too deep to allow connection of the Torque Wrench, use a compatible socket extension to reach into the bucket to the Torque Test Tool. The socket extension shall not exceed 12 inches in length.
- 7.5 Place one hand on top of the Torque Wrench, directly above the center of the Torque Test Tool to keep the wrench level when applying pressure. Gently apply an even, steady pressure to the Torque Wrench while observing the adaptor for rotation. Once the adaptor begins to rotate, record the first, measured static torque on the data sheet and proceed to 7.6 and 7.7.
- 7.6 After the first static torque measurement is taken, slowly rotate the adaptor one third of full rotation (120 degrees) from the point of the first torque measurement location. Using the same technique as specified in 7.3, record the second static torque measurement.
- 7.7 Following the first and second static torque measurements, rotate the adaptor a second, one third of full rotation (120 degrees) and take the third static torque measurement according to the technique listed in 7.3. Rotating the adaptor in one-third increments ensures that the average static torque is representative of the entire adaptor rotation.

## **8. POST-TEST PROCEDURES**

- 8.1 Remove the Torque Test Assembly and replace the appropriate lids on each of the spill containment buckets.
- 8.2 Remove the traffic cones from the Phase I area.

## **9. CALCULATING RESULTS**

- 9.1 Calculate the arithmetic average of the three tests for each adapter tested and record on a data sheet.

## **10. REPORTING RESULTS**

- 10.1** Report the gasoline dispensing facility name, adaptor type, manufacturer, model and grade of gasoline and static torque measurements on a data sheet as shown on Form 1.

## **11. ALTERNATE PROCEDURES**

- 11.1** This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the CARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

Form 1  
Static Torque of Rotatable Phase I Adaptors

<b>Test Company:</b>	<b>Conducted By:</b>
<b>Test Date:</b>	<b>Facility Name:</b>
<b>Facility Address:</b>	<b>City:</b>

Measurement Units: (circle one):    inch-pounds                      foot-pounds

Vapor Adaptor 1	Vapor Adaptor 2	Vapor Adaptor 3	Vapor Adaptor 4
Brand:	Brand:	Brand:	Brand:
Model:	Model:	Model:	Model:
Grade:	Grade:	Grade:	Grade:
Torque 1:	Torque 1:	Torque 1:	Torque 1:
Torque 2:	Torque 2:	Torque 2:	Torque 2:
Torque 3:	Torque 3:	Torque 3:	Torque 3:
Average:	Average:	Average:	Average:
360 Rotation: Yes / No	360 Rotation: Yes / No	360 Rotation: Yes / No	360 Rotation: Yes / No

Product Adaptor 1	Product Adaptor 2	Product Adaptor 3	Product Adaptor 4
Brand:	Brand:	Brand:	Brand:
Model:	Model:	Model:	Model:
Grade:	Grade:	Grade:	Grade:
Torque 1:	Torque 1:	Torque 1:	Torque 1:
Torque 2:	Torque 2:	Torque 2:	Torque 2:
Torque 3:	Torque 3:	Torque 3:	Torque 3:
Average:	Average:	Average:	Average:
360 Rotation: Yes / No	360 Rotation: Yes / No	360 Rotation: Yes / No	360 Rotation: Yes / No

Comments: \_\_\_\_\_